

THE OLD AND THE NEW CONCEPT OF A SELF-RENEWING UNIVERSE

Ervin Laszlo

There is a remarkable passage penned by the celebrated Indian Yogi Swami Vivekananda:

“According to the philosophers of India, the whole universe is composed of two materials, one of which they call Akasha. It is the omnipresent, all-penetrating existence. Everything that has form, everything that is the result of combination, is evolved out of this Akasha. It is the Akasha that becomes the air, that becomes the liquids, that becomes the solids; it is the Akasha that becomes the sun, the earth, the moon, the stars, the comets; it is the Akasha that becomes the human body, the animal body, the plants, every form that we see, everything that can be sensed, everything that exists. It cannot be perceived; it is so subtle that it is beyond all ordinary perception; it can only be seen when it has become gross, has taken form. At the beginning of creation there is only this Akasha. At the end of the cycle the solids, the liquids, and the gases all melt into the Akasha again, and the next creation similarly proceeds out of this Akasha. (...)”

“The sum total of all forces in the universe, mental or physical, when resolved back to their original state, is called Prana. ... At the end of a cycle the energies now displayed in the universe quieted down and became potential. At the beginning of the next cycle they start up, strike upon the Akasha, and out of the Akasha evolve these various forms...”

Swami Vivekananda, *Raja-Yoga*. Ch. 3
(Advaita Ashrama, Calcutta, 1982)

This concept dates back thousands of years. But not only is it as valid today as ever, but it is *more* valid: in the last ten years or so cosmologists have begun to take seriously the idea of a cyclically self-renewing universe. The idea that there is a basic substratum in the cosmos that becomes energized and gives explosive

birth to all the matter and all the forces that exist in the world – only to receive back again all the matter and all the forces before starting another cycle – this is the warp and woof of the latest cosmologies. Here is a brief sampling:

There is the familiar “Big Crunch scenario”: ultimately the expansion of the universe will come to an end and as gravitation overtakes the momentum of expansion the universe will collapse back on itself. According to John Wheeler this need not be the end: there could be another Big Bang and another universe could come into being. In the quantum regime reigning in the supercrunched state almost infinite possibilities exist for universe-creation.

Universes could follow each other one by one; or many universes could arise at the same time. The latter is the case if the explosion that gave rise to them was “reticular,” made up of a number of individual regions. In Andrei Linde’s inflation theory the Big Bang had distinct regions, much like a soap bubble in which smaller bubbles are stuck together. As such a bubble is blown up, the smaller bubbles become separated and each forms a distinct bubble of its own.

New universes could also be created inside black holes. The extreme high densities of these space-time regions represent “singularities” where the known laws of physics do not apply. Stephen Hawking and Alan Guth suggested that under these conditions the black hole’s region of space-time detaches itself from the rest and expands to create a universe of its own.

One of the most recent cyclic cosmologies is the work of Paul J. Steinhardt of Princeton and Neil Turok of Cambridge. According to Steinhardt and Turok, the universe undergoes an endless sequence of cosmic epochs, each of which begins with a “Bang” and ends in a “Crunch.” Each cycle includes a period of gradual and then further accelerating expansion, followed by reversal and the beginning of an epoch of contraction. They estimate that at present we are about 14 billion years into the current cycle and at the beginning of a trillion-year period of

accelerated expansion. Ultimately our universe will achieve the condition of homogeneity, flatness, and energy needed to begin the next cycle.

The latest cosmologies tell us that the universe is not a one-shot affair: it arises and dies back again and again. But what is there when all the matter and all the forces in the world die back? According to Vivekananda, the answer is Akasha, and also Prana (although the latter merely in a potential form). "When there was neither aught nor naught, when darkness was covering darkness, what existed then? Then Akasha existed without motion. The physical motion of the Prana was stopped, but it existed all the same."

What answer can we give to this question (of what existed when nothing existed) in light of the latest cosmologies of science? This answer, too, is unambiguous: it is the *quantum vacuum*. The quantum vacuum is that cosmic substratum that becomes unstable in universe-creating explosions, and into which the last remnants of degenerate matter fall back at the final evaporation of black holes. It is both the beginning and the end, the cradle and the deathbed of universes. But, although they die, universes do not *stay* dead: they come back to life as the vacuum re-energizes itself. The vacuum is Akasha and Prana rolled into one: the dynamic virtual-energy substratum that endures through all of time and fills all of space.

More and more interactions have come to light between this fundamental field and the observed things and processes of the physical world. Not long ago Harold Puthoff, Bernhard Haisch and collaborators produced a sophisticated theory according to which the inertial force, the gravitational force, and even mass are not independent fundamental givens in the cosmos but consequences of the interaction of charged particles with the vacuum. Puthoff also noted that electrons orbiting atomic nuclei constantly radiate energy, so that they would move progressively closer to the given nucleus were it not that the quantum of

energy they absorb from the vacuum offsets the energy lost due to their orbital motion.

Even the stability of our planet in its orbit around the Sun derives from vacuum-energy inputs. As the Earth pursues its orbital path it loses momentum, and – given a constant loss of momentum – in the absence of an influx of energy from the ZPF the gravitational field of the Sun would overcome the centrifugal force that pushes the Earth around its orbit and the Earth would spiral into the Sun. This means that in addition to inertia, gravity, and mass, the very stability of both atoms and solar systems is due to interaction with the zero-point field of the vacuum.

Although much remains yet to be discovered about the quantum vacuum, it is already clear that it is a superdense cosmic medium. It carries light, and all the universal forces of nature. Pressure waves may propagate through it, traversing the universe from one end to the other. Astronomers in NASA's Chandra X-ray Observatory found a wave generated by the supermassive black hole in the Perseus cluster of galaxies, some 250 million light years from Earth. This vacuum pressure wave translates into the musical note of B flat. This is a real note that has been traveling through the vacuum for the past 2.5 billion years. Our ears cannot perceive it: its frequency is fifty-seven octaves below middle-C – more than a million billion times deeper than the limits of human hearing.

The quantum vacuum transports light, energy, pressure, and sound. Could it also convey *information*? This possibility has been raised by a number of investigators. Puthoff remarked, “. . . on the cosmological scale a grand hand-in-glove equilibrium exists between the ever-agitated motion of matter on the quantum level and the surrounding zero-point energy field. One consequence of this is that we are literally, physically, ‘in touch’ with the rest of the cosmos as we share with remote parts of the universe fluctuating zero-point fields of even

cosmological dimensions.” And, he added, “Who is to say whether, for example, modulation of such fields might not carry meaningful information as in the popular concept of ‘the Force’?” Apollo astronaut Edgar Mitchell’s experience while in space led him to the same conclusion. According to Mitchell, information is part of the very substance of the universe. It is one part of a “dyad” of which the other part is energy. Information is present everywhere, and has been present since the birth of the universe. The quantum vacuum, Mitchell said, is the holographic information mechanism that records the historical experience of matter.

Superposed wave-patterns in the vacuum are nature’s “holograms,” they carry information on all the particles, and all the ensembles of particles that exist and evolve in space and time. The conclusion that emerges is that *the quantum vacuum is the holographic memory of the universe.*

This is also not new: this, too, has been anticipated in the concept of Akasha. Akasha is not only the permanent ground of all there is, it is also the permanent *record* of all there is. This is the much discussed “Akashic Chronicle,” the chronicle that conserves the trace of all there is in the world, and all that ever was.

Let us conclude this exploration with a poetic vision inspired by the latest findings of the sciences: the vision of an information- and energy-based cosmos that arises from, descends into, and arises again in a universal virtual-energy medium that physicists still call vacuum but is not empty space. *It is a cosmic plenum.*

Imagine, if you will, a lightless, soundless, formless plenum. It is filled with the fluctuating energies out of which all things arise in space and in time. There is no-thing in this cosmic fullness, yet there is every-thing, in potential.

Everything that can and will ever happen is here, in formless, soundless, lightless, quiescent turbulence.

After an infinity of cosmic eons, a sudden explosion, untold magnitudes greater than any turbulence ever witnessed or even imagined by human beings, penetrates the formless turbulence; a shaft of light rises from its epicenter. The plenum is no longer quiescent; it is rent by a supercosmic force emerging from its hitherto soundless and lightless depth. It liberates gigantic forces, transforming the plenum from virtual formlessness into dynamic formative process. The surface foams with instantly appearing and disappearing ripples of energy, forming and annihilating in a cosmic dance of unimaginable speed and momentum. Then the initial demented rhythm becomes more sedate, the foam more orderly. The ripples radiate outward from the epicenter, bathed in pure light of infinite intensity.

As the foam expands, it becomes grainier. Swirls and vortexes appear, incipient if as yet evanescent wave-patterns modulating the surface of the evolving plenum. With the passing of further cosmic eons the ripples of patterned energy consolidate into lasting forms and structures. They are not separate from each other, for they are micro-patterns structuring into larger patterns within a common wave-field. They are part of the underlying and now no longer formless plenum that erupted and created them. Each ripple is a microworld in itself, pulsating with the liberated energies of the plenum and reflecting in its micrototality the macrototality from which it emerged.

After another cosmic eon the energies liberated by the initial explosion dissipate across the surface of the plenum. But now another shaft of light rends the plenum, breaking its quiescent turbulence and reviving it with another formative burst: a new universe is born. This time the ripples and structures that form on the surface do not appear randomly, at the mercy of chance: they derive from a plenum in-formed with the holo-trace of prior ripples and waves.

The cosmic drama repeats time after time. Further shafts of light radiate outward from the epicenter, and another multitude of ripples moves outward to dance and to interact. The new universe ends as the ripples and the structures it brought into being vanish at the surface. But the holograms created by them in the depth inform the next universe, born as further explosions rend the plenum. Time after time, the cosmic drama repeats, but it does not repeat in the same way. It builds on its own past, on the memory of the ripples and waves that appeared and then disappeared in prior universes.

In universe after universe the plenum brings forth micro-ripples and mega-wave-structures. In each universe the ripples and waves vanish, but their memory lives on. In the next universe new and more elaborate structures appear, carrying the evolution of the micro-ripples and mega-structures to fresh heights. The plenum is no longer formless: its surface is of unimaginable complexity and coherence; its depth is fully informed. In the course of innumerable cycles of evolution, devolution, and re-evolution the self-renewing universe realizes all the potential encoded in its fundamental medium: in Akasha, the virtual energy-sea of the quantum vacuum.